Figure 1
SEQ ID NO:1

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TCCACCAGGCCCCTCGCCTGGGTACCATCGAGAAATGCCCGCCTTTGTGTCCAAGTGACA
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CAGCTCCCCAGACTATCACTACATCATGGAGAATCTCTTCCTGTACGTCATCAGCAGCCT
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Figure 2
SEQ ID NO:2

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TAKNMPGDSADLFGDGSAEDGSAANGRLWRTVIIGEQEHRIDLHMIRPYM
KVVTHGGYYGEGLNAIIVFAACFLPDSSSPDYHYIMENLFLYVISSLELL
VAEDYMIVYLNGATPRRRMPGIGWLKKCYHMIDRRLRKNLKSLIIVHPSW
FIRTVLAISRPFISVKFISKIQYVHSLEELERLIPMEHVQLPDCVLQYEE
QRLRAKRESTRPPQPEFLLPRSEEKPETVEEEDRAAEATEDQETSMS
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Figure 3
SEQ ID NO:3

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 121  cctgcacccc  acccacccct  gcacaaaaga  gctggcgggc  gctggccacg  tcgccctggg
 181  tgaccttcct  cggatgcaga  atccgcccct  gcgagcatcc  tcttcctcct  aggctctgaa
 241  ggcccgggga  gcgtgagcga  tgcccagctg  cacccgggca  gggctcgcct  ttgtttgcca
 301  gtaaggagga  gaggctgtct  cagctgcaga  ggggtcatcc  ctgcttcaag  ccagtgcctc
 361  ttcccagctc  ccatggggac  caccgaagcc  acgctccgga  tggaaaacgt  ggacgtgaag
 421  gaggaatggc  aggacgaaga  tcttcccagg  ccactcccag  aagagacggg  ggtggaactg
 481  cttggcagcc  cggtggaaga  cacatcctct  cctcccaaca  cgctaaattt  caacggagcg
 541  catcgtaaga  ggaagacgct  ggtggcccca  gagatcaaca  tttctctgga  tcagagtgag
 601  gggtccctgc  tgtccgatga  cttcttggat  acccctgatg  acctggatat  taacgtggat
 661  gacatcgaga  ccccgatga   gaccgactcg  ctggagttcc  tggggaatgg  caacgaactg
 721  gagtgggaag  acgacacccc  cgtggccacc  gccaagaaca  tgcccgggga  cagcgcggat
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 901  gtggtcaccc  acggagggta  ctacggcgaa  ggcctcaacg  ccatcatcgt  cttcgcagcc
 961  tgcttccttc  cagacagcag  cctccccgac  taccactaca  tcatggagaa  cctcttcctg
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1081  ggtgccacgc  cccggcggag  gatgcctgga  atcggctggc  tgaagaagtg  ctaccagatg
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1201  attcggactg  tgctggccat  ctctcgccct  ttcatcagcg  tcaagttcat  caacaagatc
1261  cagtacgtgc  acagcttgga  agacctggag  ·caactcatcc  ctatggaaca  cgtccagatc
1321  ccagactgcg  tcctgcaata  cgaagaggaa  agactgaagg  ccaggaggga  gagcgcgagg
1381  ccccagccgg  agtttgtgct  gcccaggtct  gaagagaagc  cagaggtggc  accagtggaa
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1681  taacgatgca  gtatttgtgc  gttccagaaa  agggcccagc  tctgagcccc  tcacccttcc
1741  acactcacga  actctcagcc  gaggaaggca  agaagcgcag  ggggtggccc  gcgtggcgtc
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2041  tcacacccat  ggttttttcat  ttgacccgcc  cccttctcgc  tcataatgac  acccagctcc
2101  tttgagagga  tcagagccca  ttgcacaaga  agagccgctg  ccaaccatcc  ttgtcctccg
2161  attgcaaaat  gacaccccag  taatctagaa  cattctcaag  cccctttaac  tcagatgtca
2221  agccaccggg  caaacccgt   caatacctcc  caccaaggaa  tgagatatgt  ggacctcact
2281  gctcccccaa  cccagcgtca  ggctgggaca  cgccaacgct  gttccgggtt  ggaacagcag
2341  aggctcagaa  actggctctg  aaataggcag  acctagcaag  aggaagatac  agggtatcgg
2401  gcgtttgagt  gtttcagaag  tcattcggga  agataaatcc  agtgcgctgg  ccgcagccac
2461  ctgcattcaa  agcttggacc  agcgggttct  tgttcgggag  gcaaatttcc  ctaggaaaaa
2521  gaagacagac  ttttctaatg  tggtccaaat  gcggatcact  ggtcagatgg  actctagaag
2581  cactgagctc  cctgtctctg  gaagtattta  agaaaaggct  gggccaggca  cgatggctca
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2761  ggcgtggtgg  caggtgcctg  taatcccagc  tacttgggag  gctgaggcat  gagaatcact
2821  taaacctgag  aggcagaggt  tacagtgagc  caagatcgtg  ccactgcatt  ccagcctggg
2881  cgacagagca  agactctgtc  tcaaaaaaaa  aaaaaaaa
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Figure 4
SEQ ID NO:4

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LFLYVISSLELLVAEDYMIVYLNGATPRRRMPGIGWLKKCYQMIDRRLRKNLKSLIIV
HPSWFIRTVLAISRPFISVKFINKIQYVHSLEDLEQLIPMEHVQIPDCVLQYEEERLK
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Figure 5

Figure 6

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1 huKIAA1872  MGTTEATLRMENVDV KEEWQDEDLPRPLPE ETGVELLGSPVEDTS SPPNTLNFNGAHRKR KTLVAPEINISLDQS EGSLLSDDFLDTPDD
2 Macaque     MGTTEATLRMENVDV KEEWQDEDLPRPLPE ETGVELLGSPVEDTS SPPNTLNFNGAHRKR KTLVAPDINISLDQS EGSLLSDDFLDTPDD
3 mujittery   MGTTEATLRMENVIV RDEWQDEDLPRPLPE DTGVERLGGAVEDSS SPPSTLNLSGAHRKR KTLVAPEINISLDQS EGSLLSDDFLDTPDD
4 huBNIP2     --------MEGVEL  KEEWQDEDFPIPLPE DDSIEADILAITGPE DQPGSLEVN-GNKVR KKLMAPDISLTLDPS DGSVLSDDLDES---
5 muNIP2      --------MEGVEL  KEEWQDEDFPIPLPE DDSIEADILAITGPE DQPGSLEVN-GNKVR KKLMAPDISLTLDPS DGSVLSDDLDES---
              15            30            45            60            75            90

              91            106           121           136           151           166
1 huKIAA1872  LDINVDDIETPDETD SLEFLGNGNELEWED DTPVATAKNMPGDSA DLFGDGTTEDGSAAN GRLWRTVIIGEQEHR IDLHMIRPYMKVVTH
2 Macaque     LDINVDDIETPDETD SLEFLGNGNELEWGD DTPVATAKNMPGDSA DLFGDGTTEDGGAAN GRLWRTVIIGEQEHR IDLHMIRPYMKVVTH
3 mujittery   LDINVDDIETPDETD SLEFLGNGNELEWED DTPVATAKNMPGDSA DLFGDGSAEDGSAAN GRLWRTVIIGEQEHR IDLHMIRPYMKVVTH
4 huBNIP2     GEIDLDGLDTPSE-- ------NSNEFEWED DLPKPKTTEVIRKGS ITEYTAAEEK---ED GRRWRMFRIGEQDHR VDMKAIEPYKKVISH
5 muNIP2      GEIDLDGLDTPSE-- ------NSNEFEWED DLPKPKTTEVIRKGS ITEYTAAEEK---ED GRRWRMFRIGEQDHR VDMKAIEPYKKVISH
              105           120           135           150           165           180

              181           196           211           226           241           256
1 huKIAA1872  GGYYGEGLNAIIVFA ACFLPDSSLPDYHYI MENLFLYVISSLELL VAEDYMIVYLNGATP RRRMPGIGWLKKCYQ MIDRRLRKNLKSLII
2 Macaque     GGYYGEGLNAIIVFA ACFLPDSSLPDYHYI MENLFLYVISSLELL VAEDYMIVYLNGATP RRRMPGIGWLKKCYQ MIDRRLRKNLKSLII
3 mujittery   GGYYGEGLNAIIVFA ACFLPDSSSPDYHYI MENLFLYVISSLKLL VAENYMIVYLNGATP RRRMPGIGWLKKCYH MIDRRLRKNLKSLII
4 huBNIP2     GGYYGDGLNAIVVFA VCFMPESSQPNYRYL MDNLFKYVIGTLELL VAENYMIVYLNGATT RRKMPSLGWLRKCYQ QIDRRLRKNLKSLII
5 muNIP2      GGYYGDGLNAIVVFA VCFMPESSQPNYRYL MDNLFKYVIGTLELL VAENYMIVYLNGATT RRKMPSLGWLRKCYQ QIDRRLRKNLKSLII
              195           210           225           240           255           270

              271           286           301           316           331           346
1 huKIAA1872  VHPSWFIRTVLAISR PFISVKFINKIQYVH SLEDLEQLIPMEHVQ IPDCVLQYEEERLKA RRESARP-QPEFVLP RSEEKPEVAPVENRS
2 Macaque     VHPSWFIRTVLAISR PFISVKFINKIQYVH SLEDLEQLIPMEHVQ IPDCVLQYEEERLKA RRESARP-QPEFVMP RSEEKPEVAPVENRS
3 mujittery   VHPSWFIRTVLAISR PFISVKFISKIQYVH SLEELERLIPMEHVQ LPDCVLQYEEQRLRA KRESTRPPQPEFLLP RSEEKPETVEEEDRA
4 huBNIP2     VHPSWFIRTLLAVTR PFISSKFSQKIRYVF NLAELAELVPMEYVG IPECIKQVDQELNGK QDEPKNEQ------- ---------------
5 muNIP2      VHPSWFIRTLLAVTR PFISSKFSQKIRYVF NLAELAELVPMEYVG IPECIKQVDQELNGK QDEPKNEQ------- ---------------
              285           300           315           330           345           360

              361
1 huKIAA1872  ALVSEDQETSMS   375
2 Macaque     APVTEDQETSMS   371
3 mujittery   AEATEDQETSMS   372
4 huBNIP2     ------------   314
5 muNIP2      ------------   314
              375
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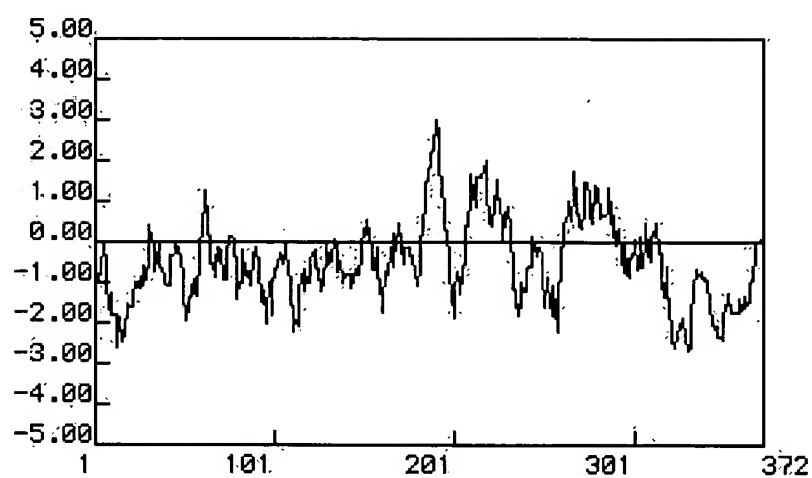
Figure 7

Figure 8
SEQ ID NO:8

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 361  ttcccagctc  ccatggggac  caccgaagcc  acgctccgga  tggaaaacgt  ggacgtgaag
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 781  ctatttgggg  acggcacgac  ggaggacggc  agcgccgcca  acgggcgcct  gtggcggaca
 841  gtgatcatcg  gggagcaaga  gcaccgtata  gacctgcaca  tgatccggcc  ttacatgaaa
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2521  gaagacagac  ttttctaatg  tggtccaaat  gcggatcact  ggtcagatgg  actctagaag
2581  cactgagctc  cctgtctctg  gaagtattta  agaaaaggct  gggccaggca  cgatggctca
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Figure 9
SEQ ID NO:9

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LFLYVISSLELLVAEDYMIVYLNGATPRRRMPGIGWLKKCYQMIDRRLRKNLKSLIIV
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Figure 10
SEQ ID NO:10

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241 tgaaggcccg gggagcgtga gcgatgccca gctgcacccg ggcagggctc gcctttgttt

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361 ccaggataaa ccgtctccct ggaaggttta tccggcagcc tttgccgcct ctaaatccct

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961 gacccacccc accccatcct tagaagactg tggagtcaac gcctgtggct gcagctggca

1021 gggggtgggg gtcgggggcg gggctggtgg gagtgttcct gggggctgag gtcacaccca

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Figure 11
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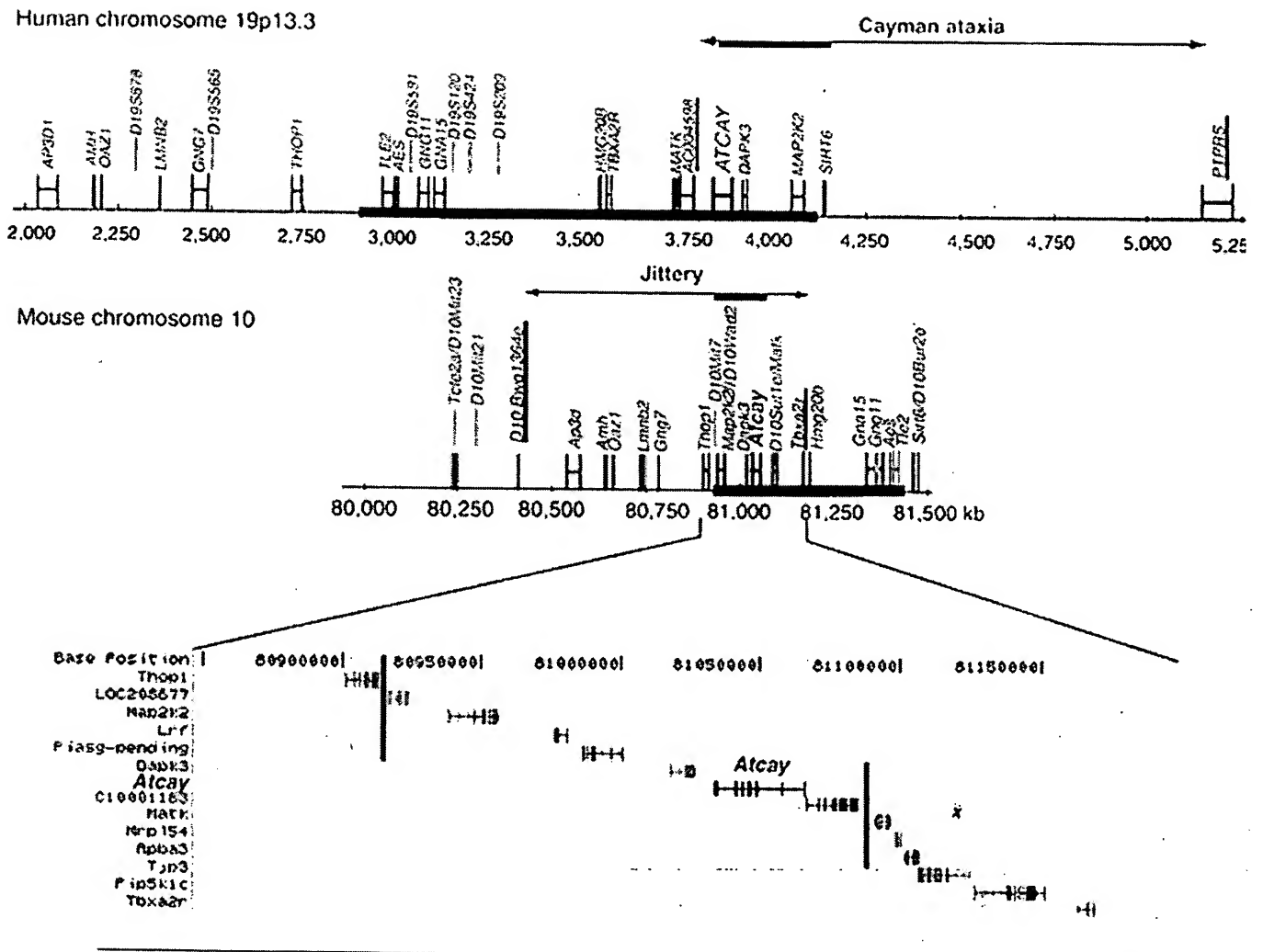
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 acgatgatgg cagggaactg gtggtattta gtgctgaggg gcagtgatac agaaagattt
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 agacgtcgtc tccatgagct ttggggggac ttttatgtgg aataaagaaa ctatcactg
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Figure 12

Human chromosome 19p13.3

Cayman ataxia

AP3D1 AMH OAZ1 D19S578 LMNB2 GNG7 D19S565 THOP1 TLE2 AES D19S391 GNG11 GNA15 D19S120 D19S424 D19S209 HNG309 TBXA2R MATK AC005598 ATCAY DAPK3 MAP2K2 SIRT6 PTBP5

2.000   2.250   2.500   2.750   3.000   3.250   3.500   3.750   4.000   4.250   4.500   4.750   5.000   5.25

Jittery

Mouse chromosome 10

Tcte2a/D10Mit23 D10Mit21 D10Bwg1364e Ap3d Amh Oaz1 Lmnb2 Gng7 Thop1 D10Mit7 Map2k2/D10Wsu2 Dapk3 Atcay D10Sutc/Matk Tbxa2r Hmp200b Gna15 Gng11 Ap3 Tlc2 Sirt6/D10Bur2o

80,000   80,250   80,500   80,750   81,000   81,250   81,500 kb

Base Position   80900000| 80950000| 81000000| 81050000| 81100000| 81150000|
Thop1
LOC203677
Map2k2
Lrf
Piasg-pending
Dapk3
Atcay   Atcay
C10001183
Matk
Nrp154
Apba3
Tsn3
Pip5k1c
Tbxa2r

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  1 ATCAY        MGTTEATLRMENVDV KEEWQDEDLPRPLPE ETGVELLGSPVEDTS SPPNTLNFNGAHRKR KTLVAPEINISLDQ
  2 ATCAY(Maca)MGTTEATLRMENVDV KEEWQDEDLPRPLPE ETGVELLGSPVEDTS SPPNTLNFNGAHRKR KTLVAPDINISLCQ
  3 Atcay        MGTTEATLRMENVDV RDEWQDEDLPRPLPE DTGVERLGGAVEDSS SPPSTLNLSGAHRKK KTLVAPEINISLCQ
  6 huKIAA0367 (N-term. end cut off!)EDVGMDIPF EEGV-LSPSAADMRP EPPNSLDLNDTHPRR IKLTAPNINLSLCQ
  7 mu0367homo (N-term. end cut off!)     MDIHF EEGV-LSPSAADMRP EPPNSLDLNGSHPRR IKLTAPNINLSLCQ
  4 BNIP2        --------MEGVEL KEEWQDEDFPIPLPE DDSIEADILAITGPE DQPGSLEVN-GNKVR KKLMAPDISLTLDP
  8 Bnip2        --------MEGVEL KEEWQDEDFPIPLPE DDSIEADTLDGTDPD RQPGSLEVN-GNKVR KKLMAPDISLTLDP
  9 DrosCG11593   (N-term. end cut off - only C-terminal end aligned)


                 91           105 106          120 121           135 136          150 151          165
  1 ATCAY        LDINVDDIETPDETD SLEFLGNGNELEWED DTPVATAKNMPGDSA DLFGDGTTEDGSAAN GRLWRTVIIGEQEH
  2 ATCAY(Maca)LDINVDDIETPDETD SLEFLGNGNELEWGD DTPVATAKNMPGDSA DLFGDGTTEDGGAAN GRLWRTVIIGEQEH
  3 Atcay        LDINVDDIETPDETD SLEFLGNGNELEWED DTPVATAKNMPGDSA DLFGDGSAEDGSAAN GRLWRTVIIGEQEH
  6 huKIAA0367 IDINVDELDTPDEAD SFEYTGH------ED --PTAN-KDSGQESE SIPEYTAEEER--ED NRLWRTVVIGEQEQ
  7 mu0367homo IDINVDELDTPDEAD SFRYTNH------ED --PTAN-KSSGQESE SIPEYTAEEER--ED NRLWRTVVIGEQEQ
  4 BNIP2        GEIDLDGLDTPSE-- ------NSNEFEWED DLPKPKTTEVIRKG- SITEYTAAEEK--ED GRRWFMFRIGEQDH
  8 Bnip2        GEVDLEGLDTPSE-- ------NSDEFEWED DLPKPKTTEVIRKG- SITEYTATEEK--GD GRRWRMFRIGEQDH
  9 DrosCG11593 (N-term. end cut off - only C-terminal end aligned)YTAAEERR--D SRNWQKITLPDGRT


                 181          195 196          210 211          225 226          240 241          25
  1 ATCAY        GGYYGEGLNAIIVFA ACFLPDSSLPDYHYI MENLFLYVISSLELL VAEDYMIVYLNGATP RRRMPGIGWLKKCY
  2 ATCAY(Maca)GGYYGEGLNAIIVFA ACFLPDSSLPDYHYI MENLFLYVISSLELL VAEDYMIVYLNGATP RRRMPGIGWLKKCY
  3 Atcay        GGYYGEGLNAIIVFA ACFLPDSSSPDYHYI MENLFLYVISSLELL VAEDYMIVYLNGATP RRRMPGIGWLKKCY
  6 huKIAA0367 GGYYGDGLNAIIVFA ACFLPDSSRADYHYV MENLFLYVISTLELM VAEDYMIVYLNGATP RRRMPGLGWMKKCY
  7 mu0367homo GGYYGDGLNAIIVFA ACFLPDSSRADYHYV MENLFLYVISTLELM VAEDYMIVYLNGATP RRKMPGLGWMKKCY
  4 BNIP2        GGYYGDGLNAIVVFA VCFMPESSQPNYRYL MDNLFKYVIGTLELL VAENYMIVYLNGATT RRKMPSLGWLRKCY
  8 Bnip2        GGYYGDGLNAIVVFA VCFMPESGQPNYRYL MDNLFKYVIGTLELL VAENYMIIYLNGATT RRKMPSLGWLRRCY
  9 DrosCG11593GGY  GGQNAIVIFC ACHLPDRSRARYSYV MDNLFLYVVKTLEQL VTDDYVLIYLHGGSN RRNVPPFPWLRRCY
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Sec14/CRALTRIO domain

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                 271          285 286          300 301          315 316          330 331          34
  1 ATCAY        VHPSWFIRTVLAISR PFISVKPINKIQYVH SLEDLEQLIPMEHVQ IPDCVLQYEEERLKA RRESARP-QPEFVL
  2 ATCAY(Maca)VHPSWFIRTVLAISR PFISVKFINKIQYVH SLEDLEQLIPMEHVQ IPDCVLQYEEERLKA RRESARP-QPEFVM
  3 Atcay        VHPSWFIRTVLAISR PFISVKFISKIQYVH SLEELERLIPMEHVQ LPDCVLQYEEQRLRA KRESTRPPQPEFLL
  6 huKIAA0367 VHPSWFIRTILAVTR PFISSKFSSKIKYVN SLSELSGLIPMDCIH IPESIIKLDEELREA SEAAKTSCLYNDPE
  7 mu0367homo VHPSWFIRTILAVTR PFISSKFSSKIKYVT SLSELSGLIPMDCIH IPESIIKLDEELREA SEAAKTSCLYNDPE
  4 BNIP2        VHPSWFIRTLLAVTR PFISSKFSQKIRYVF NLAELAELVPMEYVG IPEC-IKQVQELNGK ---QDE--------
  8 Bnip2        VHPSWFIRTLLAVTR PFISSKFSQKIRYVF NLAELAELVPMEYVG IPEC-IKQYEEEKPK KRVDQEPLNGKQEP
  9 DrosCG11593VHPTFWIKSLVWMAR PFVSTKFWRKLVYVK SLEELGMHVVVEKAA IPEKVKQYD--AKRH

                 361          375
  1 ATCAY        ALVSEDQETSMS    human 19p13.3
  2 ATCAY(Maca)APVTEDQETSMS    - -
  3 Atcay        AEATEDQETSMS    mouse 10
  6 huKIAA0367 ------------    human  9q21
  7 mu0367homo ------------    mouse 19 - 66 Mb
  4 BNIP2        ------------    human 15q22
  8 Bnip2        ------------    mouse 9 - 70 Mb
```

Figure 13

Figure 14

Genotypes

	10n	35	25	31	15	39	37	17	28	21	18
D18S424	88	18	18	28	28	84	88	88	88	84	43
D18S209	22	22	22	32	32	21	22	22	22	23	31
A002R35	22	22	22	22	22	22	22	22	22	21	12
A008X33	11	11	11	11	11	11	11	11	11	12	22
21944ata	55	55	55	15	15	55	55	55	55	55	13
HIBx4	11	11	11	11	11	11	11	11	11	11	12
4K17CA1	11	11	11	11	11	11	11	11	11	11	36
A004M07	22	22	22	22	22	22	22	22	: :	22	12
SH3GL1x3b	11	11	11	11	11	11	11	11	11	11	22
D18S394	44	44	44	44	44	44	44	44	44	44	46
16492ec1	22	22	22	22	22	22	22	22	22	22	11
33063CA	11	11	11	11	11	11	11	11	11	11	33
D18S216	33	33	33	33	33	33	33	33	33	33	25
16601GT	11	11	11	11	11	11	11	11	11	11	36
PTPRSx7	: :	: :	: :	: :	: :	: :	22	12	22	22	11
31646ATA	33	33	33	33	33	33	33	33	33	33	14
34296GT	22	22	22	22	22	22	22	22	22	22	23
GATA66B01x	44	44	44	44	44	44	43	44	42	42	25
UT1057	33	33	33	33	33	33	33	43	35	35	46
D18S534	11	11	11	11	11	11	13	11	13	13	32

Figure 15

Table 2

Marker	Forward	Reverse	Alleles	Size
21944ata	ctggaactacaggaatgtacc	tttctgctcttgcttcacgg	5	411
4k17ca	tgtgttcacctactacctac	aaagaccaaagtctggcag	6	225
31646ata	aaatgcatcctgctgccttc	gatccaatgtgacatgccac	4	210
16601gt	caccagtgcagagaatcctt	tctctgggctgtgtgagagc	6	189
33083ca	atgacaagcactccagcctga	agcttgcagtgagccgagat	3	206
16492ec1	gccgtttgacgtgcattgtt	agcaatatccgctcttcctg	2	187
PTPRSX7	gactcctagttgtctccct	cacacatagggacaaagag	2	266
A008X33	agacagagtaagacaaaaacacc	gatttgagaagatgtcagttt	2	160
A002R35	tggcttattttctcatc	cacttgtgctgagactct	2	232
HIBx4	gcacgaaaacagactaatacgg	gttgcatttcagacctctcc	2	185
XRRC1ca1	ccgatggatctacagttgca	tcttggatgagaaccaactc	6	159
ERRC1ca2	ttacaggagtgagccaccat	aggactcacaagtggttg	7	215
ERRC2ca6	ttgtactcactgtgtgccag	tagtaagccaagatcactccc	4	244
79129ca	ttagaagcccgtgttggaac	ctgtgatttgtggagtgtgg	7	207
282485ca3	tagtccagggattggcaa	gaagacgtaacatgtccag	2	319
282485ca4	agccctaatactcgcttctg	gcaggttgcagaataccttg	3	186
82621gt1	tctgctgtagtatcctcttc	gactatgaagggagaagta	6	151